

("Farnworth et al."). In addition, claims 2-13, 23-26 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,285,079 to Tsukamoto et al. ("Tsukamoto et al."). Claims 1, 21 and 27 were indicated as being allowable.

The Applicant would like to thank Examiners Vu and Loke for the courtesies that were extended to Applicant's representatives in the personal interview that was conducted on December 12, 2001. During the Personal Interview, the undersigned specifically discussed independent claims 2 and 23 with the Examiners and pointed out there was an insulating layer 36 between the barrier film 34 and the semiconductor substrate 30 in Farnworth et al. After some discussion, the Examiners suggested that independent claims 2 and 23 be amended to require that the "barrier film" in the claims 2 and 23 be "directly in contact with" the semiconductor substrate in order to more clearly define the pending claims over both Farnworth et al. and Tsukamoto et al. This Amendment adopts the Examiners' suggestion to amend independent claims 2 and 23 in this manner.

Applicant respectfully submits that as a result of this amendment, all of the pending claims are unobvious over both Farnworth et al. and Tsukamoto et al. since neither of these references teaches or suggests that a film such as the claimed barrier film of the present invention should be directly in contact with a semiconductor substrate. In both Farnworth et al. and Tsukamoto et al., another material is interposed between these layers.

Favorable consideration and withdrawal of the rejections under 35 U.S.C. §103(a) over both Farnworth et al. and Tsukamoto et al. is requested for at least the foregoing reasons.

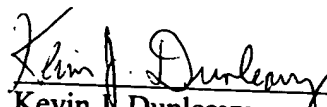
Applicant also encloses herewith an Information Disclosure Statement citing some additional references for consideration by the Examiner. Consideration of these references is respectfully requested. The applicant has paid the required fee of \$180.00 for consideration of the references.

## **2. Conclusion**

Applicant has made an earnest effort to place this application in condition for allowance. If the Examiner feels that a telephone interview would expedite prosecution

of this patent application, he is respectfully invited to telephone the undersigned at 215-599-0600.

Respectfully submitted,

  
Kevin J. Dunleavy  
Registration No. 32,024

Date: April 8, 2002

KNOBLE & YOSHIDA, LLC  
Eight Penn Center, Suite 1350  
1628 John F. Kennedy Boulevard  
Philadelphia, PA 19103  
Phone: (215) 599-0600  
Fax: (215) 599-0601

Marked Up Copy of the Claims Showing Amendments

2. (Five Times Amended) A semiconductor comprising:  
a semiconductor substrate material having a surface;  
a barrier film ~~directly on~~ in direct contact with said semiconductor substrate surface, said barrier film having a layer comprising elemental barium atoms on said surface;  
a conductor on said barrier film, said conductor having a tendency to diffuse into said semiconductor substrate material if in direct contact therewith; and wherein said elemental barium atoms are between said conductor and said semiconductor substrate such that said layer serves as a barrier, inhibiting diffusion of the conductor into the semiconductor substrate material.
23. (Four Times Amended) A semiconductor device comprising:  
a semiconductor substrate;  
a barrier film comprising elemental barium atoms, having a thickness in the range of approximately 5 Å to approximately 100 Å ~~on~~ in direct contact with said substrate; and  
a metallic material positioned on said barrier film such that said elemental barium atoms are between said metallic material and said semiconductor substrate.